

# PATENT SPECIFICATION

603,804



Application Date: Oct. 30, 1945. No. 28760/45.

Complete Specification Accepted: June 23, 1948.

INDEX AT ACCEPTANCE:—Class 4, G8.

## COMPLETE SPECIFICATION Wheel Mountings for Aircraft

I, LYNDON WHITE MANHEIM, Sr., of 208 Blueridge Drive, Greenville, State of South Carolina, United States of America, a citizen of the United States of America, do hereby  
5 declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

My invention relates to wheel mountings  
10 for aircraft, such as aeroplanes, gliders or airships.

An important object of the invention is to provide means to rotate the landing wheel in the direction of travel of the aircraft and at  
15 approximately the speed of travel of the same.

A further object of the invention is to provide means for subjecting the lower portion of the wheel to the action of a rearwardly travelling air current while subjecting the  
20 upper portion of the wheel to the action of a forwardly travelling air current, thus, utilizing, to the maximum extent, in rotating the wheel, air pressure due to the travel of the aircraft.

A further object of the invention is to  
25 provide means to reverse the direction of travel of the air current to drive the wheel.

A further object of the invention is to provide means to regulate the action of the air current upon the wheel, to regulate its speed of rotation.

30 A further object of the invention is to provide means of the above mentioned character which are of simplified construction and will not materially increase the air resistance of the aircraft during flight.

35 Other objects and advantages of the invention will be apparent during the course of the following description.

According to the present invention there is provided therefore a wheel mounting for  
40 aircraft landing wheels, including a casing forming a chamber into which extends the upper half of the wheel which is rotatably mounted about a horizontal axis, and means forming with said casing an air passage separate  
45 from said chamber and extending longitudinally of the direction of flight and having its forward end open so that air travels rearwardly through the passage and is discharged by the same in a forward direction into said chamber and  
50 against the upper portion of the wheel therein to rotate the latter.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a front elevation of a wheel mounting for aircraft embodying my invention,  
55 Figure 2 is a transverse section taken on the line 2—2 of Figure 1, upon an enlarged scale and with parts broken away, and,

Figure 3 is a transverse section taken on the line 3—3 of Figure 2, parts being broken away.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention the numeral 5 designates an  
60 aircraft, shown as an aeroplane, having a fuselage 6 and main sustaining planes 7.

Arranged beneath each plane 7 is a wheel mounting 8 secured to the plane. These wheel mountings are arranged upon opposite  
70 sides of the fuselage 6 and are equi-distantly spaced therefrom. The invention is not restricted to the wheel mountings being attached to the planes 7 as they may be attached to the fuselage.

Each wheel mounting comprises an air receiving hood or casing 9, extending longitudinally of the direction of flight of the aircraft, and comprising laterally spaced sides 10, connected by a top 11. The top 11 is trans-  
80 versely curved or arched, as shown in Figure 3, and is longitudinally curved and extends downwardly toward its trailing end and is then bent to provide a forwardly and upwardly directed extension or lip 12, as shown in Figure  
85 2. Arranged between the sides 10 and rigidly secured thereto is a web or wall 13, which is transversely curved or arched and longitudinally curved and generally semi-cylindrical in longitudinal section. At its forward end, 90 the wall 13 diverges forwardly from the top 11, while its rear portion is generally concentric with the top 11 and the rear end of the wall 13 is disposed above the curved extension 12, spaced therefrom, and arranged rearwardly of  
95 the free forward end of the extension 12. The wall 13 forms with the hood or casing 9 an air passage 14, arranged between the wall 13 and top 11, and a main chamber 11' between the wall 13 and the sides 10. This air passage  
100 flares toward its leading end while its rear end discharges into the extension 12. It is thus

seen that the passage 14 is exteriorly of the main chamber 11', and discharges into the trailing end of the main chamber 11'. The passage 14 and main chamber 11' both extend longitudinally of the direction of travel of the aircraft.

Means are provided to regulate the volume of air passing through the passage 14, including a damper or valve 15, arranged within the passage 14 and carried by a pivoted rod 16, having a crank 17 operated by suitable remote control.

The numeral 18 designates a wheel, carried by a spindle or shaft 19, journaled in suitable bearings 20, attached to the sides 10. The wheel 18 is equipped with pneumatic tyre 21. This tyre has its upper portion operating within the main chamber 11', beneath the web or wall 13, and the periphery of the tyre is suitably spaced from the web 13, to provide a proper clearance and is spaced a greater distance from the sides 10. The tyre also projects downwardly beyond the chamber 11', as shown. It is preferred that about one half of the tyre be within the chamber 11'. The tyre 21 is preferably provided upon its opposite sides, near its tread with radial vanes or projections 22, which may be made integral therewith or may be made separate therefrom, and secured thereto by any suitable means.

The hood or housing is rigidly connected with struts 23, in turn rigidly attached to the plane 7.

The operation of the mounting is as follows:—

With the valve 15 in the open position, and the aircraft in flight, a rearwardly travelling current of air is impinging upon the lower portion or half of the tyre 21, engaging the tread portion of the tyre and the vanes 22, thus rotating the tyre in the direction of travel of the aircraft. A rearwardly travelling current of air enters the leading end of the air passage 14 and travels rearwardly therein until it reaches the extension 12, at which position its direction of travel is reversed and it then enters the trailing end of the main chamber 11' and travels in a forward direction within the chamber 11' beneath the web or wall 13, about the tread of the tyre and in contact with the vanes. This forwardly travelling current of air now engages the tread of the tyre and the vanes, within the chamber, and rotates the tyre in the direction of travel of the aircraft. It is thus seen that the currents of air caused by the flight of the aircraft are utilized to the maximum extent for rotating the wheel. By adjusting the valve 15, the volume of the air current travelling through the passage 14 may be regulated or reduced, so that the wheel will travel at substantially the speed of the aircraft. It is thus seen that at the instant that the

tyres contact with the ground or the like in landing they are rotating in the direction of travel of the air craft, at a proper speed. This will effect an easy and proper landing and will reduce the wear upon the tyres.

While I have shown the tyre 21 as equipped with vanes to aid in its rotation, yet some degree of success may be had by omitting these vanes, as the frictional engagement between the air currents and the tyre are sufficient to rotate the tyre.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A wheel mounting for aircraft, landing wheels, including a casing forming a chamber into which extends the upper half of the wheel which is rotatably mounted about a horizontal axis, and means forming with said casing an air passage separate from said chamber and extending longitudinally of the direction of flight and having its forward end open so that air travels rearwardly through the passage and is discharged by the same in a forward direction into said chamber and against the upper portion of the wheel therein to rotate the latter.

2. A wheel mounting as set forth in Claim 1, in which said wheel is provided with a tyre having vanes on its outer surface against which the air discharged by the forwardly directed rear end of said air passage is directed.

3. A wheel mounting as set forth in Claim 1, in which said air passage is formed between the top wall of said casing and a wall attached in spaced relation above said top wall and extending rearwardly of the same to form said longitudinally extending air passage, said wall extending rearwardly and downwardly substantially to the horizontal plane in which the axis of rotation of said wheel is positioned and forming at this point with the trailing end of said casing a forwardly and upwardly directed discharge nozzle for discharging air from the rear end of said air passage into the upper half of the trailing end of said chamber.

4. A wheel mounting as set forth in Claim 3, including means in said air passage for controlling the rearward travel of the air therethrough.

5. A wheel mounting for aircraft substantially as shown and described and for the purpose set forth.

Dated this 30th day of October, 1945

FRANK B. DEHN & CO.

For the Applicant  
Chartered Patent Agents,  
Kingsway House,  
108 Kingsway,  
London, W.C.2.

Printed for H.M. Stationery Office by W. S. Ltd., The Ebor Press, York: 39-220—1948.

Published at the Patent Office, 25, Southampton Buildings, London, W.C.2,  
from which copies, price 1s. 0d. each (inland), 1s. 1d. (abroad) may be obtained.

[This Drawing is a reproduction of the Original on a reduced scale.]

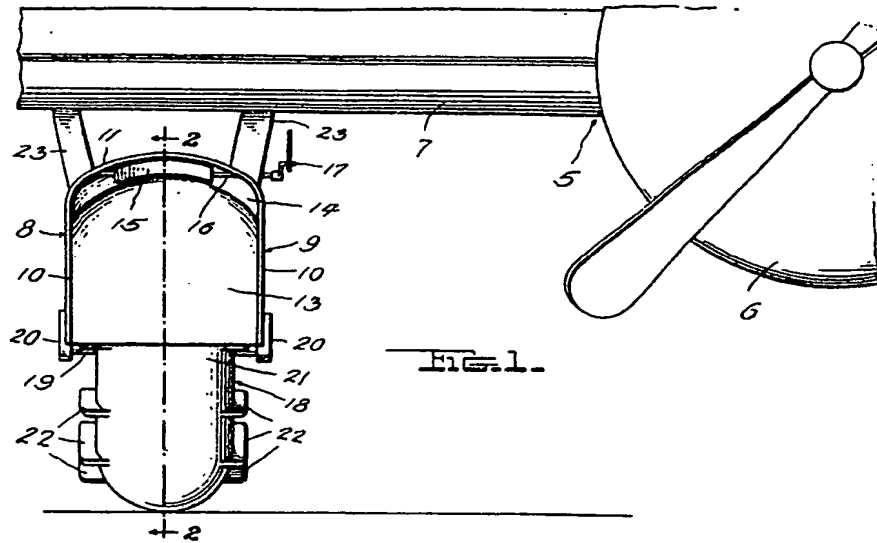


FIG. 1.

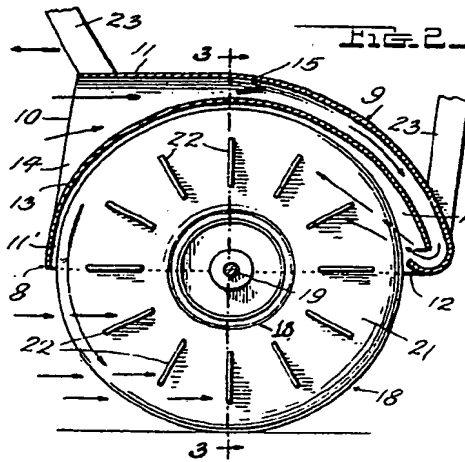


FIG. 2.

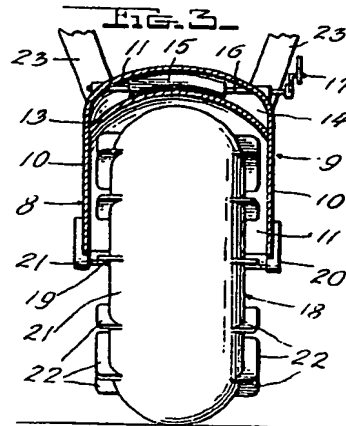


FIG. 3.

**THIS PAGE LEFT BLANK**